

COMPUTER SCIENCE Year 11 Curriculum End Points and Key Vocabulary

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1		
Ethos Links	<p>STEM - problem solving, programming, making links & applying knowledge, what IoT is, what embedded systems are, how data is routed around the internet, protocols</p> <p>Character - risk-taking, resilience, perseverance & learning from mistakes, critical thinking, reasoning & making judgements, researching, analysis & evaluation</p>	<p>STEM - problem solving, programming, making links & applying knowledge</p> <p>Character - risk-taking, resilience, perseverance & learning from mistakes, critical thinking, reasoning & making judgements, researching, analysis & evaluation</p> <p>Sustainability - impact of technology on environment, amount of energy being generated by technology</p>	<p>STEM - problem solving, programming, making links & applying knowledge, how bitmap images are represented, how sound is represented, constructing expressions to calculate the size of bitmap and sound files, compression of data</p> <p>Character - risk-taking, resilience, perseverance & learning from mistakes, critical thinking, reasoning & making judgements</p>	<p>STEM - problem solving, programming, making links & applying knowledge, laws associated with the use of technology, AI and robotics, privacy, keeping data safe</p> <p>Character - risk-taking, resilience, perseverance & learning from mistakes, critical thinking, reasoning & making judgements, researching, analysis & evaluation</p>	<p>STEM – problem solving, making links & applying knowledge</p> <p>Character – Critical Thinking, reasoning & making judgements, analysis & evaluation</p>		
Learning End Points	<p>CT: Problem Solving with Programming AT1 By the end of this unit students will know and understand:</p> <ul style="list-style-type: none"> The terms: <ul style="list-style-type: none"> 'procedure' 'function' 'parameter' 'return value' 'local variable' 'global variable' When to use Local and Global variables <p>Principles: Hardware 2 and Networks 2 By the end of this unit students will know and understand:</p> <ul style="list-style-type: none"> Define what is meant by the term 'embedded system', 'Internet of Things' (IoT) How an embedded system differs from a general-purpose computer Applications of embedded systems The role of embedded systems in the IoT Security and privacy issues associated with the IoT 	<p>CT: Problem Solving with Programming AT2 By the end of this unit students will know and understand:</p> <ul style="list-style-type: none"> Describe the characteristics of a bubble sort Describe the characteristics of a binary search <p>Principles: Issues & Impact 1 and Programming Languages By the end of this unit students will know and understand:</p> <ul style="list-style-type: none"> The environmental impact of the manufacture of digital technology Ways in which the environmental impact can be reduced How the energy consumed by digital devices harms the environment How energy consumption can be reduced Define what is meant by the term 'e-waste', 'low-level language', 'high-level language', 'compiler', 'interpreter' and 'intellectual property' 	<p>CT: Problem Solving with Programming SpT1 By the end of this unit students will know and understand:</p> <ul style="list-style-type: none"> Define the terms valid, erroneous, boundary (extreme) data Understand the characteristics of one-dimensional data structures Discuss efficiency considerations for one-dimensional structures <p>Principles: Data 3 By the end of this unit students will know and understand:</p> <ul style="list-style-type: none"> How bitmap images are represented in binary Define what is meant by the terms 'bitmap', 'pixel', 'resolution', 'colour depth', 'amplitude', 'sample rate', 'bit depth' and 'sample interval' How the number of available bits impacts on the accuracy of the representation and why there is always a trade- 	<p>CT: Problem Solving with Programming SpT2 By the end of this unit students will know and understand:</p> <ul style="list-style-type: none"> The characteristics of two-dimensional structures (record/entity/row, column/field, mixed types) Define the terms local and global in terms of variables Define the terms function, procedure, parameters, return value <p>Principles: Issues & Impacts 2 By the end of this unit students will know and understand:</p> <ul style="list-style-type: none"> Define the meaning of the terms 'AI', 'machine learning', 'robotics', 'algorithmic bias', 'digital footprint', 'identity theft' and 'data misuse' Applications of these AI, machine learning and robotics Ethical issues associated with the use of AI, machine learning and robotics 	<p>Revision By the end of this unit students will know and understand:</p> <ul style="list-style-type: none"> The structure of the Exams How to answer theory questions How to answer programming questions Key points from units covered over the course 		

	<ul style="list-style-type: none"> • Why power is an important consideration for many IoT devices • How packet switching is used to transmit data between devices on the internet • The purpose of an IP address • The role of routers • How the TCP/IP stack enables different types of devices attached to different networks to communicate with each other across the internet • What each layer of the stack does • What each protocol does 	<ul style="list-style-type: none"> • Environmental issues associated with the disposal of digital technology • How responsible recycling can reduce the environmental impact of digital technology • How the short replacement cycle of mobile phones and other digital devices impacts on the environment • Why each processor has its own unique instruction set • How writing a program in a low-level language differs from writing one in a high-level language • The need for program translators • The advantages/disadvantages of each approach • Possible consequences of IP theft • How copyright, patents and trademarks help to protect IP 	<p>off between resolution and storage space/bandwidth.</p> <ul style="list-style-type: none"> • The process of converting analogue sound into binary data. • Why an analogue sound is never fully reproducible in binary • Factors that affect the fidelity of the digital representation • Reasons for wanting to reduce file sizes (storage, streaming) • How compression affects file sizes • The difference between lossless and lossy compression • The advantages/disadvantages of each type of compression 	<ul style="list-style-type: none"> • Safety and accountability issues associated with the use AI, machine learning and robotics • The benefits and drawbacks of AI, machine learning and robotics and recommend how they should be regulated • How and why organisations collect personal data • Benefits and drawbacks of sharing personal data with other people and organisations. • Privacy concerns associated with the collection and use of personal data • Why it is difficult to attribute ownership of personal data to a specific individual • The rights of data subjects and the obligations of organisations laid down in the UK Data Protection Act 		
<p>Key Vocabulary</p>	<ul style="list-style-type: none"> • Problem Solving with Programming AT1 Keywords • Hardware 2 & Networks 2 Keywords 	<ul style="list-style-type: none"> • Problem Solving with Programming AT2 Keywords • Issues & Impact 1 & Programming Languages Keywords 	<ul style="list-style-type: none"> • Problem Solving with Programming SpT1 Keywords • Data 3 Keywords 	<ul style="list-style-type: none"> • Problem Solving with Programming SpT2 Keywords • Issues & Impacts 2 Keywords 	<ul style="list-style-type: none"> • GCSE Computer Science Command Words 	